

# EARTHING & LIGHTNING PROTECTION SOLUTION

*Air Termination Network Solution*



*Earthing Solution*



*Exothermic Welding*



**ELPS  
DESIGN  
SOLUTION**

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# 1. INTRODUCTION TO RAYCHEM RPG

## 1.1. Company Profile

Raychem RPG (P) Ltd., incorporated in 1989, is a 50:50 joint Venture between TE Connectivity, U.S.A. (formerly Tyco Electronics) and RPG Enterprises, India.

TE Connectivity is a US\$13 Billion global provider for solutions in Network, Transportation, Consumers and Industrial for over 50 years.

RPG Enterprises, an establishment of over 30 years, is one of India's fastest growing business groups with turnover of US\$ 3 Billion. The group has more than fifteen companies managing diverse business interests in the areas of Automotive Tyres, Infrastructure, IT and Specialty including Pharmaceuticals, Power Ancillaries & Plantations.

## 1.2. Earthing & Lightning Protection Solution

At Raychem RPG we provide you with complete one stop solution for all your Earthing and Lightning protection needs. As a solution provider we offer you with :-

### 1. Lightning Protection Solution which includes:

- **Risk Assessment Calculation:**

The aim of the risk assessment process is to remove a hazard or reduce the level of risk by adding precautions or control measures as necessary. By doing so, we aim to create a safe workplace.

Raychem RPG technical team has developed Arrestek (software RA.version-01), an invaluable tool which automates the complex calculations required by IEC/EN 62305-2.

To access the tool please use the below link:  
<http://raychemrpg.com/risk-assessment-software/>

- **Direct Lightning:**

As per the Risk Assessment Calculation protection level will be finalised. Based on the protection level and as per the requirements of the project / client, Lightning Protection Passive System (BS EN / IEC 62305) & (NFPA 780) and Active System (NFC 17-102) will be proposed.

- **Indirect Lightning Protection: Surge Protection DevTice (SPD)**

Indirect lightning system protects against transient induced over voltage / current to the internal equipments like:

- 1) Power
- 2) Data & Telecommunication

### 2. Earthing Solution which includes:

- **On-Site Soil Resistivity Survey and Ground Resistance Measurement:**

Raychem RPG conducts the soil resistivity survey to determine the electrical resistance of the ground at a specific location. This is done by high end test instrument, capable of filtering out unwanted electrical noise that may foul the results gained.

Our team of Engineers and Technicians will attend to your site and carryout a full electrical assessment of the ground.

All work is carried out in accordance with BS 7430:2011 (Code of practice for protective earthing of electrical installations), BS EN 50522:2010 (Earthing of power installations exceeding 1kV a.c.).

- **Earthing Calculation:**

Earthing calculations (Earth Grid Conductor Cross section, Earth rod cross section and earthing grid calculations to achieve the <1  $\Omega$ m) for Residential, Commercial and Industrial projects based on soil resistivity survey value of site, fault current in kA of Main Distribution Board (MDB).

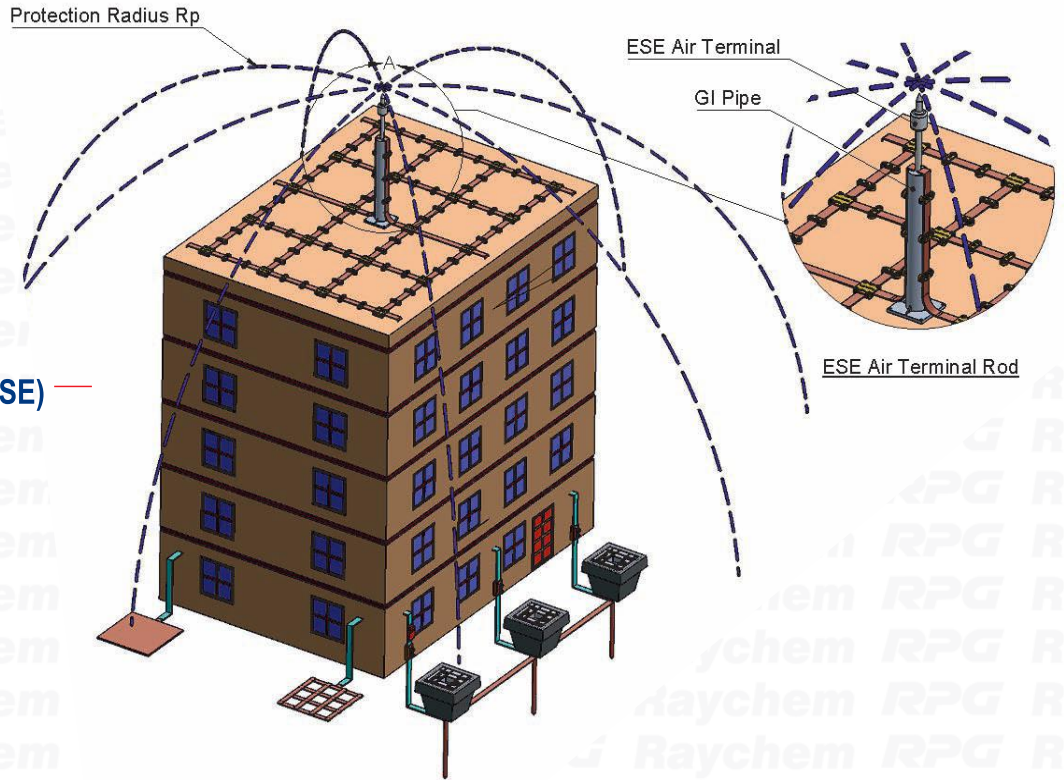
- **Earthing Design:**

Based on the earthing calculation (BS 7430 / IEEE 80), we provide earthing system design for different type of structures. We also recommend back fill component where corrosive atmosphere to achieve required ground resistance.

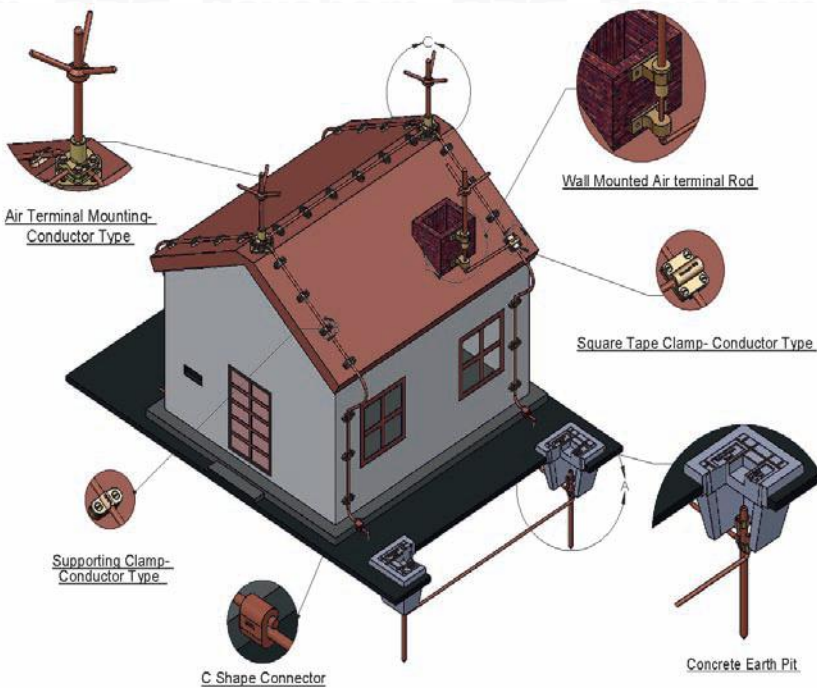
# EARTHING & LIGHTNING

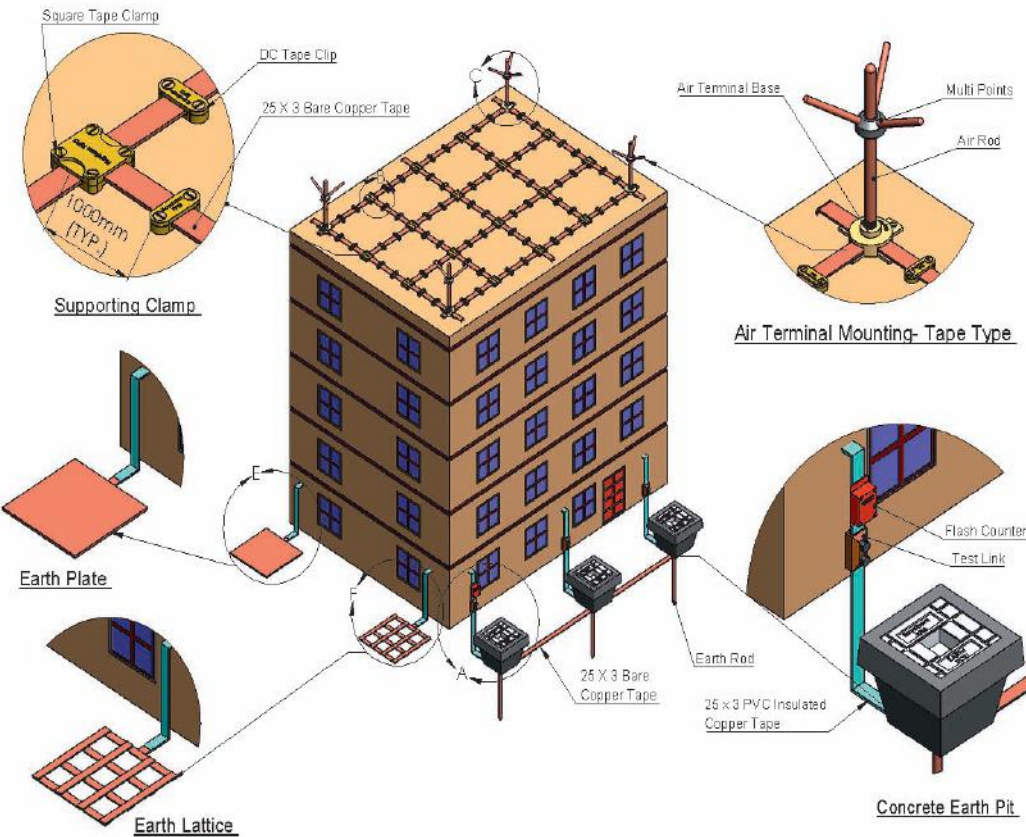
## Protection Solution

### Early Streamer Emission (ESE) Air Termination Network – Active System



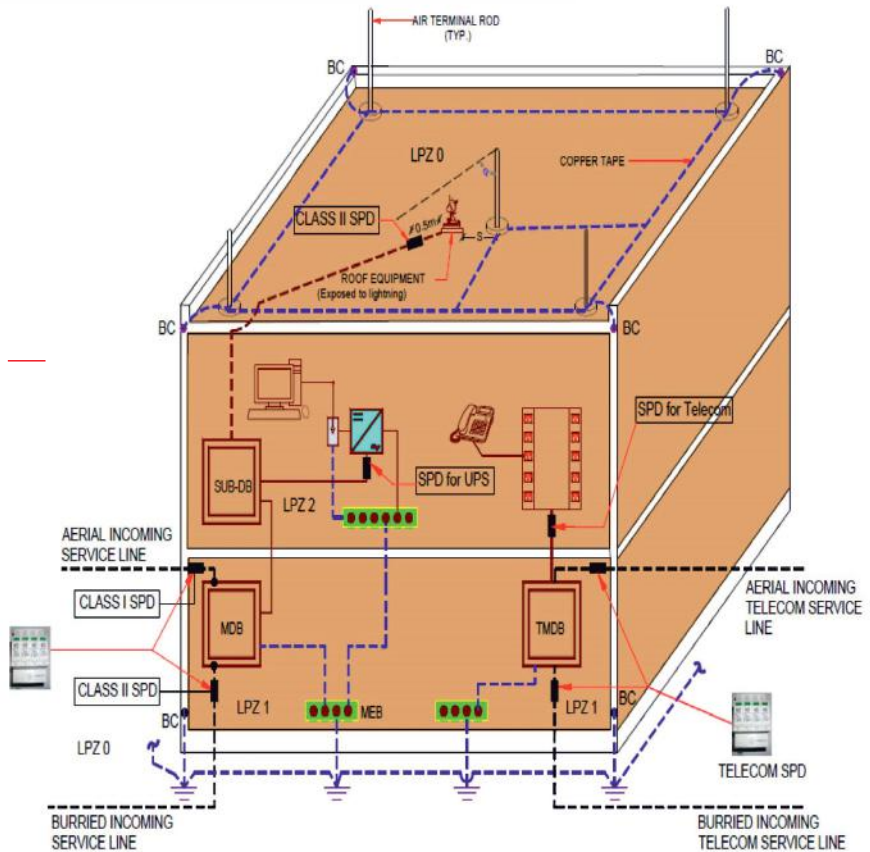
### Lightning Protection Network - Triangular Structure





**Conventional  
— Air Termination Network  
- Passive System**

**Surge Protection Device (SPD)  
— Indirect Lightning Protection**





# 2. LIGHTNING PROTECTION

## 2. LIGHTNING PROTECTION

### 2.1. Direct Lightning Protection (Direct Strike To Structures)

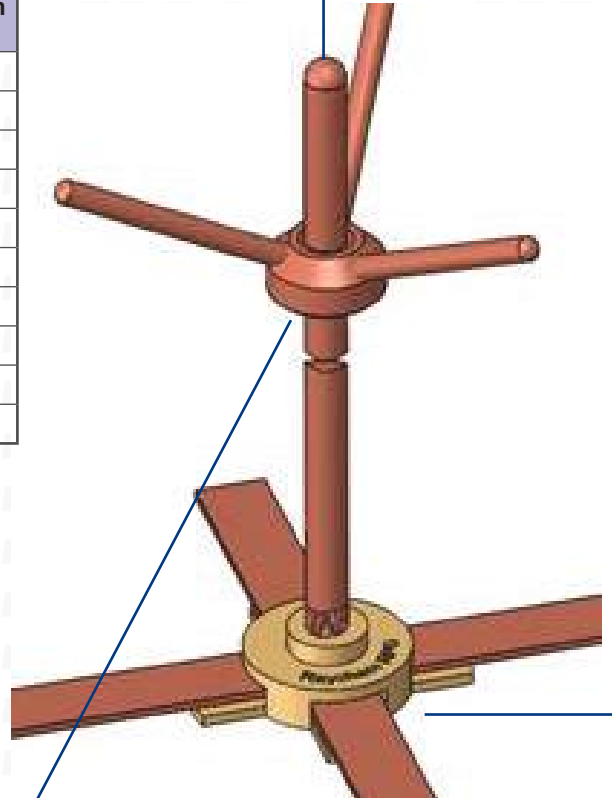
#### 2.1.1. Conventional

##### Air terminal Rods - Passive Components

Air Terminal Rod is used on highest point of an elevated structure to captures maximum lightning strike .

Product Code		Nominal dia. in mm	Thread Size	Length mm
Pure Copper	Aluminium			
RAR -01	RARA -01	15	M16	300
RAR -02	RARA -02	15	M16	500
RAR -03	RARA -03	15	M16	1000
RAR -04	RARA -04	15	M16	1500
RAR -05	RARA -05	15	M16	2000
RAR -06	RARA -06	19	M20	300
RAR -07	RARA -07	19	M20	500
RAR -08	RARA -08	19	M20	1000
RAR -09	RARA -09	19	M20	1500
RAR -10	RARA -10	19	M20	2000

- Grade of Copper used is ETP - Cu, having 99.9% purity.



#### 2.1.2. Multipoint

Product Code		Product Name
Copper Alloy	Aluminium	
RMP-01	RMPA - 01	Multipoint Set for 15mm dia. rod
RMP-02	RMPA - 02	Multipoint Set for 19mm dia. rod



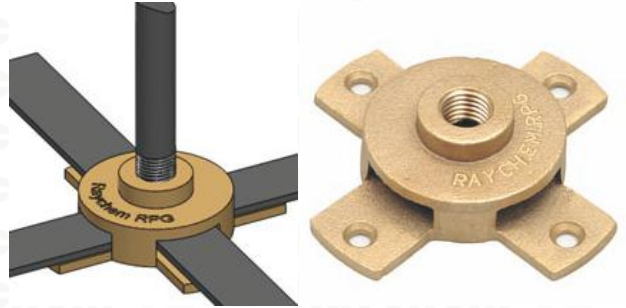


### 2.1.3. Air Terminal Base

#### Base: Tape Type

Electrical connection between air terminal rod and down conductor.

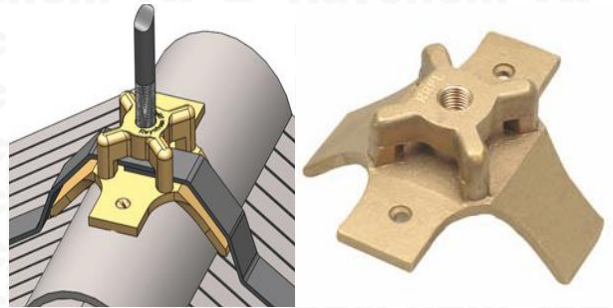
Product Code		Thread Dia	Tape in mm
Copper Alloy	Aluminium		
RAT-01	RATA-01	M16	25 x 3
RAT-03	RATA-03	M20	25 x 3



#### Ridge Saddle: Tape Type

Used to provide support to the Air terminal rod on roof ridges.

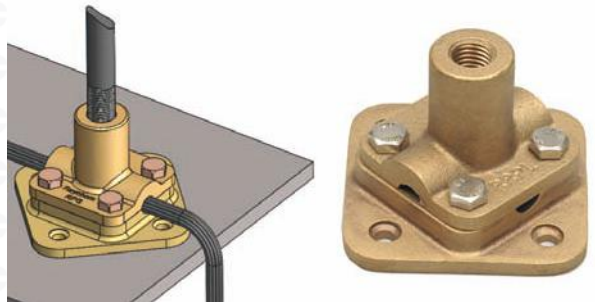
Product Code		Thread Dia.	Max. Tape Size in mm
Copper Alloy	Aluminium		
RRS-01	RRSA-01	M16	30 x 6
RRS-03	RRSA-03	M20	30 x 6



#### Conductor Type

Electrical connection between air terminal rod and down conductor (conductor).

Product Code		Cross Section in mm <sup>2</sup>	Threading Dia.
Copper Alloy	Aluminium		
RAT - 101	RATA - 101	50	M16
RAT - 102	RATA - 102	50	M20
RAT - 103	RATA - 103	70	M16
RAT - 104	RATA - 104	70	M20
RAT - 105	RATA - 105	95	M16
RAT - 106	RATA - 106	95	M20



## 2. LIGHTNING PROTECTION

### Side Mounting Rod Brackets

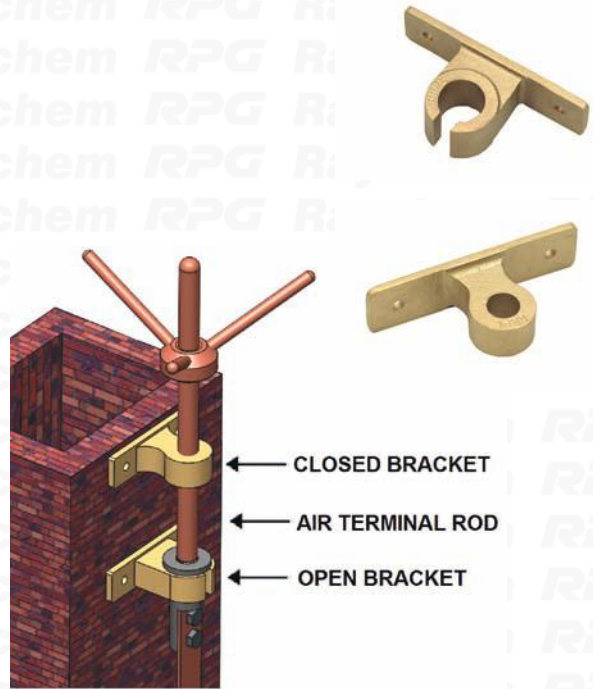
Used to provide support to the Air terminal rod on side / wall mounting.

#### Open Type Bracket

Product Code (Open Type)		Rod dia. in mm
Copper Alloy	Aluminium	
RROB-01	RROBA-01	15
RROB-02	RROBA-02	19

#### Closed Type Bracket

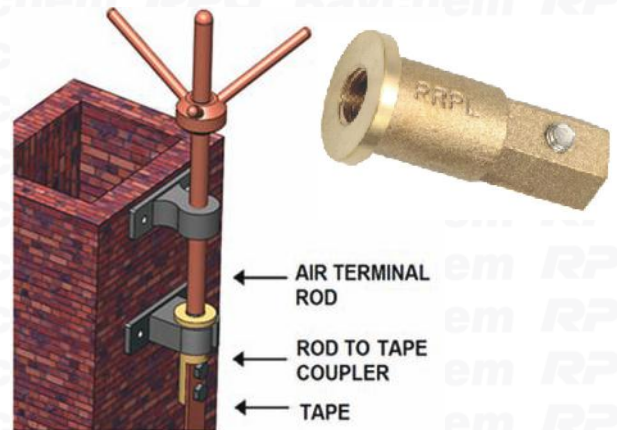
Product Code (Closed Type)		Thread dia. in mm	Tape Size in mm
Copper Alloy	Aluminium		
RRCB-01	RRCBA-01	15	25x3
RRCB-02	RRCBA-02	19	25x3



### Connection Clamp: Rod to Tape Coupling

Used to provide coupling support to the Air terminal rod to Tape on side / wall mounting bracket.

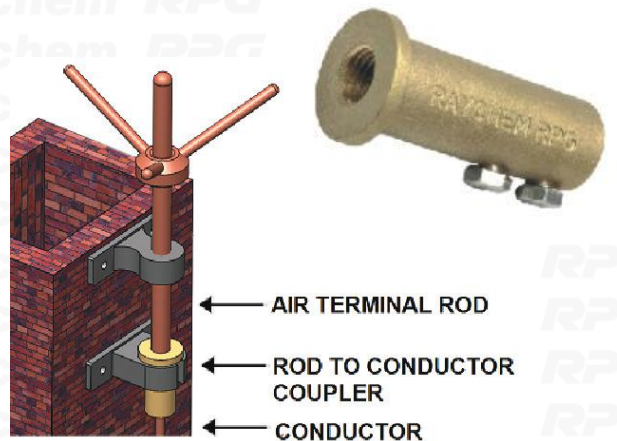
Product Code		Thread dia.	Tape Size in mm
Copper Alloy	Aluminium		
RTC-01	RTCA-01	M16	25x3
RTC-03	RTCA-03	M20	25x3



### Connection Clamp: Rod to Cable Coupling

Used to provide coupling support to the Air terminal rod to Cable / conductor on side / wall mounting bracket.

Product Code		Thread Dia.	C / S Range in mm <sup>2</sup>
Copper Alloy	Aluminium		
RRC-01	RRCA-01	M16	35 - 95
RRC-02	RRCA-02	M20	35 - 95



## 2.2. Down Conductor Network

### 2.2.1. Down Conductors - Tape

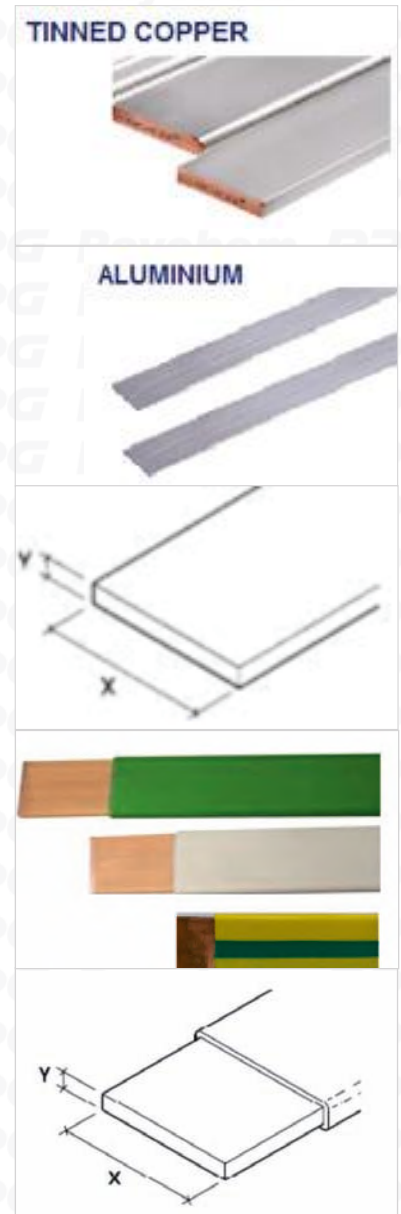
- Tape provides least resistance path from lightning fault current to ground earth pit.
- PVC Insulation provides protection against shock while carrying fault current of bare conductor

Product Code				Bare Tape (X * Y) mm
Bare Tape			PVC Covered Copper	
Copper	Tinned Coated Copper	Aluminium		
RBCT - 01	RTCT-01	RBAT - 01	RPCT-01	12.5 x 1.5
RBCT - 02	RTCT-02	RBAT - 02	RPCT-02	12.5 x 3
RBCT - 03	RTCT-03	RBAT - 03	RPCT-03	20 x 1.5
RBCT - 04	RTCT-04	RBAT - 04	RPCT-04	20 x 3
RBCT - 05	RTCT-05	RBAT - 05	RPCT-05	25 x 1.5
RBCT - 06	RTCT-06	RBAT - 06	RPCT-06	25 x 3
RBCT - 07	RTCT-07	RBAT - 07	RPCT-07	25 x 4
RBCT - 08	RTCT-08	RBAT - 08	RPCT-08	25 x 6
RBCT - 09	RTCT-09	RBAT - 09	RPCT-09	30 x 3
RBCT - 10	RTCT-10	RBAT - 10	RPCT-10	30 x 6
RBCT - 11	RTCT-11	RBAT - 11	RPCT-11	38 x 3
RBCT - 12	RTCT-12	RBAT - 12	RPCT-12	38 x 5
RBCT - 13	RTCT-13	RBAT - 13	RPCT-13	38 x 6
RBCT - 14	RTCT-14	RBAT - 14	RPCT-14	40 x 4
RBCT - 15	RTCT-15	RBAT - 15	RPCT-15	40 x 6
RBCT - 16	RTCT-16	RBAT - 16	RPCT-16	50 x 3
RBCT - 17	RTCT-17	RBAT - 17	RPCT-17	50 x 4
RBCT - 18	RTCT-18	RBAT - 18	RPCT-18	50 x 6
RBCT - 19	RTCT-19	RBAT - 19	RPCT-19	30 x 4
RBCT - 20	RTCT-20	RBAT - 20	RPCT-20	30 x 5
RBCT - 21	RTCT-21	RBAT - 21	RPCT-21	40 x 5
RBCT - 22	RTCT-22	RBAT - 22	RPCT-22	50 x 5

- Representative products colours as per BS 5252.
- PVC Sheath colour needs to be specified clearly while placing PO.
- Grade of Copper used is ETP - Cu, having 99.9% purity.



- Representative products tested for **IEC 62561-2:2012**.
- To improve corrosion resistance, tin coating can be applied min.



### Lead Covered Copper Tape

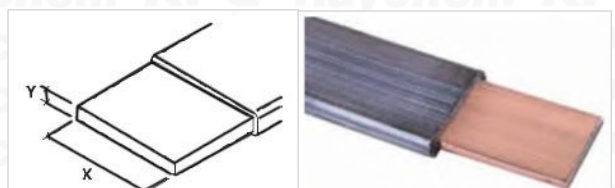
Lead-covered (Pb), high conductivity, annealed 25 x 3mm flat copper earthing tape.

Lead covered for use in highly contaminated areas.

Pb-covered lead-copper tape is annealed for ultimate ductility and has radiused edges.

Product Code	Tape Size in mm
RLST-06	25 x 3

- Material: Copper to BS EN 13601 (formerly BS 1432).
- Customized cross section available on customer request



## 2. LIGHTNING PROTECTION

### DOWN CONDUCTORS - STRANDED CONDUCTOR & SHEATHED

#### Bare Stranded Copper Conductor

- Copper stranded copper conductor provides least resistance path from lightning fault current to ground earth pit.
- Sheathed Insulation provides protection against shock while carrying fault current of bare conductor.

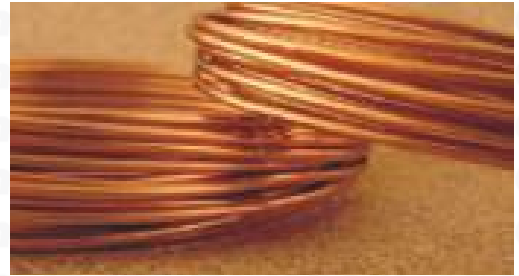


Bare Stranded Product Code	Sheathed Conductor Product Code	C/S Area in Sq.mm
RBSCC - 4	RPSCC - 4	4
RBSCC - 6	RPSCC - 6	6
RBSCC - 10	RPSCC - 10	10
RBSCC - 16	RPSCC - 16	16
RBSCC - 25	RPSCC - 25	25
RBSCC - 35	RPSCC - 35	35
RBSCC - 50	RPSCC - 50	50
RBSCC - 70	RPSCC - 70	70
RBSCC - 95	RPSCC - 95	95
RBSCC - 120	RPSCC - 120	120
RBSCC - 150	RPSCC - 150	150
RBSCC - 185	RPSCC - 185	185
RBSCC - 240	RPSCC - 240	240
RBSCC - 300	RPSCC - 300	300
RBSCC - 400	RPSCC - 400	400

- Grade of Copper used is ETP - Cu, having 99.9% purity.
- PVC Sheath colour needs to be specified clearly while placing PO.

#### Bare Solid Conductor

Copper solid copper conductor provides least resistance path from lightning fault current to ground earth pit.



Product Code	C/S Area in Sq.mm
RBSC - 8C	50
RBSC - 9C	70

- Grade of Copper used is ETP - Cu, having 99.9% purity.

#### Hard Drawn Copper Flat

Hard drawn copper flat bars suitable for used as copper bus bars.

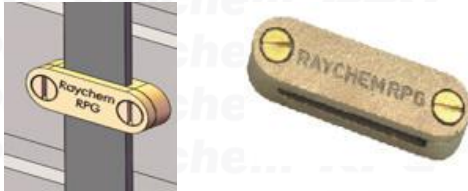


Product Code	C/S Area in mm
RHCT-01	25 x 3
RHCT-02	25 x 6
RHCT-03	38 x 6
RHCT-04	50 x 6
RHCT-05	50 x 10
RHCT-06	75 x 6
RHCT-07	100 x 6

## 2.2.2. Clamping Accessories

### D.C. Tape Clip – Tape Type

It provides support to the down conductor tape and is rigid enough to withstand mechanical stresses, lightning stresses, and thermal expansion and contraction of the conductor tapes.



Product Code		Copper Tape / Strip Size in mm
Copper Alloy	Aluminium	
RDC - 01	RDCA - 01	20 x 3
RDC - 02	RDCA - 02	25 x 3
RDC - 03	RDCA - 03	25 x 4
RDC - 04	RDCA - 04	25 x 6
RDC - 05	RDCA - 05	31 x 3
RDC - 06	RDCA - 06	31 x 6
RDC - 07	RDCA - 07	38 x 3
RDC - 08	RDCA - 08	38 x 5
RDC - 09	RDCA - 09	38 x 6
RDC - 10	RDCA - 10	50 x 3
RDC - 11	RDCA - 11	50 x 4
RDC - 12	RDCA - 12	50 x 6
RDC - 13	RDCA - 13	50 x 8
RDC - 17	RDCA - 17	30 x 5
RDC - 18	RDCA - 18	40 x 5
RDC - 19	RDCA - 19	31 x 7
RDC - 20	RDCA - 20	50 x 5



• Representative products tested for IEC 62561-2:2012

### Tape Clip – Tape Type

It supports tape / strip on the flat surface.



Product Code		Conductor Size in mm
Copper Alloy	Aluminium	
RTC - 101	RTCA - 101	20 x 3
RTC - 102	RTCA - 102	25 x 3
RTC - 103	RTCA - 103	50 x 6
RTC - 106	RTCA - 106	31 x 6

### Non Metallic D.C. Tape Clip

It provides support to the PVC insulated tape and is rigid enough to withstand mechanical stresses, lightning stresses, and thermal expansion and contraction of the conductor tapes.

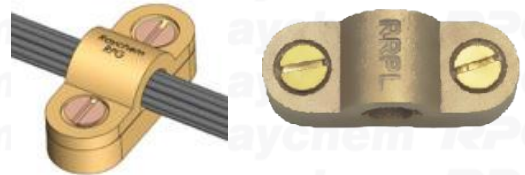
Material : Polyamide, UV Resistant



Product Code	Tape Size in mm	Colour
RDPC - 01	25 x 3	Grey

### Heavy Duty Conductor Saddle

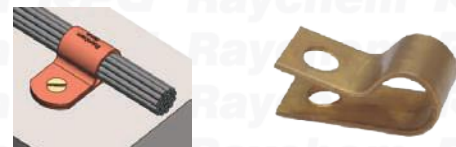
It uses in conjunction wall mounted air terminal bases.



Product Code		Conductor Dia. in Sq.mm
Copper Alloy	Aluminium	
RHDS - 01	RHDSA - 01	50
RHDS - 02	RHDSA - 02	70
RHDS - 03	RHDSA - 03	95
RHDS - 04	RHDSA - 04	240

### One Hole Clip

It supports round conductor on the flat surface



Product Code		Conductor in Sq.mm
Copper Alloy	Aluminium	
RHC-01	RHCA-01	25 - 35
RHC-02	RHCA-02	50 - 70
RHC-03	RHCA-03	95
RHC-04	RHCA-04	120
RHC-05	RHCA-05	150
RHC-06	RHCA-06	185
RHC-07	RHCA-07	240
RHC-08	RHCA-08	300

## 2. LIGHTNING PROTECTION

### Back Plate Holdfast Clamp

It's required for installation of tape / conductor, when the tape/conductor is to be secured away from the face of wall.

*Note: This should be used with appropriate D.C Tape Clip / Conductor Saddle.*



Product Code	Material
RBPH - 01	Copper Alloy
RBPH - 02	Aluminium
RBPH - 03	Brass

### Square Clamp - Tape To Conductor

Square Clamp are used to cross joints between the tape to solid conductor.



Product Code		Conductor Dia. in mm
Copper Alloy	Aluminium	
RTSC-01	RTSCA-01	8



### Square Tape Clamp (Type 1)

It's required for installation of tape / conductor, when the tape/conductor is to be secured away from the face of wall.

*Note: This should be used with appropriate D.C Tape Clip / Conductor Saddle.*



Product Code		Copper Tape / Strip size in mm
Copper Alloy	Aluminium	
RSC-01	RSCA-01	20 x 3
RSC-02	RSCA-02	25 x 3
RSC-04	RSCA-04	25 x 6
RSC-05	RSCA-05	38 x 3
RSC-07	RSCA-07	38 x 6
RSC-08	RSCA-08	50 x 3
RSC-09	RSCA-09	50 x 6



### Square Conductor Clamp - Type 1

Square conductor clamps are used for supporting or fixing the 3 - way connections on down conductor and an effective low resistive connection between overlapping conductors.



Product Code		Conductor Size. in Sq.mm
Copper Alloy	Aluminium	
RSC - 101	RSCA - 101	35
RSC - 102	RSCA - 102	50
RSC - 103	RSCA - 103	70
RSC - 104	RSCA - 104	95



\*

### Square Conductor Clamp - Type 2

Square conductor Clamps are used for supporting or fixing the 4 - way connections on down conductor and an effective low resistive connection between overlapping conductors.



Product Code		Conductor C/S in Sq.mm
Copper Alloy	Aluminium	
RSC-201	RSCA-201	35
RSC-202	RSCA-202	50
RSC-203	RSCA-203	70
RSC-204	RSCA-204	95



\*



### Self Adhesive D.C. Tape Clip

It secures conductors to surfaces that cannot be penetrated by a screw.

Suitable for aluminum, copper, Insulated tapes. Applicable for glass, Perspex, enamel and stainless steel etc.

**Disc Dia.:** 85mm

**Material:** Polyamide base with Polyamide clip, UV Resistant.



Product Code	Tape Size in mm
RSADC-253	25 X 3

Compound for Self Adhesive D.C. Tape Clip: Very High Bond (VHB) Double Sided Foam Type

1. Very conformable, double-sided, pressure-sensitive, closed-cell acrylic foam tape.
2. High strength, Durable and Clean appearance.

### Tee Clamp

It provides effective low resistance cross joints in solid circular conductor networks.



Product Code		Conductor in Sq.mm
Copper Alloy	Aluminium	
RTC-135	RTCA-35	35
RTC-150	RTCA-150	50-95



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### Bi-Metallic Connector

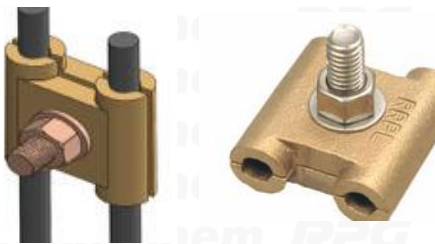
Bi-Metallic connectors are used to join aluminium and copper tapes / cables together. They enable a neat and practical jointing method without the need for tinning, riveting or wrapping the joint.



Product Code	Tape Size in mm
RBMC - 01	20 x 3
RBMC - 02	25 x 3

### Jointing Clamp

It provides effective low resistance cross joints in solid circular conductor networks.



Product Code		Conductor Dia. in mm
Copper Alloy	Aluminium	
RJC-01	RJCA-01	8



\*



### Interface Test Clamp

Provides an effective low resistance connection and disconnection between overlapping conductors.



Product Code		Conductor dia. mm	Conductor Size in mm
Copper Alloy	Aluminium		
RITC - 01	RITCA - 01	8	25 x 3



\*



### Plate Test Clamp

It's used for supporting or fixing the 4 - way connections on down conductor and an effective low resistive connection between overlapping conductors.



Product Code		Tape Size in mm
Copper Alloy	Aluminium	
RPC - 33	RPCA - 33	25 x 3



\*



### Screwdown Test Clamp

It's used to create a disconnection joint between the down conductor system with 4 - way connections and earthing system.



Product Code		Tape Size in mm
Copper Alloy	Aluminium	
RSC - 253	RSCA - 253	25 x 3



\*



## 2. LIGHTNING PROTECTION

### 2.2.3. Bonding Components

#### Earth Boss

#### Mild Steel / Stainless Steel Earth Boss

The Earth Boss is manufactured from Steel or also from Stainless Steel SS304 / SS316.

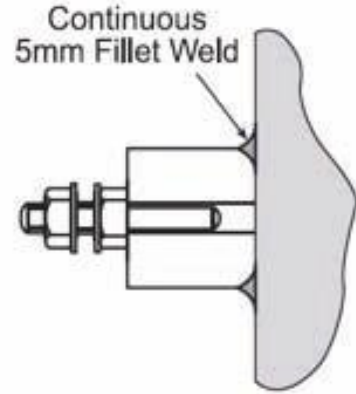
Length in mm	Dia. in mm
25	25
30	30
30	40
30	50
40	30
40	40
40	50
50	30
50	40
50	50

#### Product Key:

REB X XX (XXX)



1. Material:
  - a. S – Stainless Steel
  - b. M – Steel
2. Size – (Length x Diameter)
3. Thread Size - (As per customer requirement.)



#### Braid

#### Flexible / Circular Braid

Raychem RPG Manufacturers flexible bonding conductors / flexible earth braid as per IEC 62561-2:2012, BS EN 50164-2:2009 & BS 7430.

#### Flat Flexible Earth Braid

Product Code	Product Code	Cross Section Area	Nominal Dimension	Length of Braid	Hole Diameter (A)
Bare	Tinned	Sq.mm	mm	mm	mm
RBCB 200-6-7	RTCB 200-6-7	6	12 x 1	200	7
RBCB 400-6-7	RTCB 400-6-7	6	12 x 1	400	7
RBCB 200-10-7	RTCB 200-10-7	10	15 x 1.5	200	7
RBCB 400-10-7	RTCB 400-10-7	10	15 x 1.5	400	7
RBCB 200-16-9	RTCB 200-16-9	16	19 x 2.5	200	9
RBCB 400-16-9	RTCB 400-16-9	16	19 x 2.5	400	9
RBCB 200-25-11	RTCB 200-25-11	25	25 x 3.0	200	11
RBCB 400-25-11	RTCB 400-25-11	25	25 x 3.0	400	11
RBCB 200-35-11	RTCB 200-35-11	35	25 x 3.5	200	11
RBCB 400-35-11	RTCB 400-35-11	35	25 x 3.5	400	11
RBCB 200-50-11	RTCB 200-50-11	50	30 x 5.0	200	11
RBCB 400-50-11	RTCB 400-50-11	50	30 x 5.0	400	11
RBCB 200-70-13	RTCB 200-70-13	70	32 x 6.0	200	13
RBCB 400-70-13	RTCB 400-70-13	70	32 x 6.0	400	13
RBCB 200-95-13	RTCB 200-95-13	95	37 x 6.0	200	13
RBCB 400-95-13	RTCB 400-95-13	95	37 x 6.0	400	13
RBCB 200-120-17	RTCB 200-120-17	120	45 x 6.0	200	17
RBCB 400-120-17	RTCB 400-120-17	120	45 x 6.0	400	17
RBCB 200-150-17	RTCB 200-150-17	150	50 x 8.0	200	17
RBCB 400-150-17	RTCB 400-150-17	150	50 x 8.0	400	17



- Grade of Copper used is ETP - Cu, having 99.9% purity.
- Customised **Sizes** and **Length** available as per the request.



### Circular Flexible Earth Braid

Product Code	Product Code	Cross Section Area	Length of Braid	Hole Diameter (A)
Bare	Tinned	Sq.mm	mm	Amps
RBCCB 200-6-7	RTCCB 200-6-7	6	200	7
RBCCB 400-6-7	RTCCB 400-6-7	6	400	7
RBCCB 200-10-7	RTCCB 200-10-7	10	200	7
RBCCB 400-10-7	RTCCB 400-10-7	10	400	7
RBCCB 200-16-9	RTCCB 200-16-9	16	200	9
RBCCB 400-16-9	RTCCB 400-16-9	16	400	9
RBCCB 200-25-11	RTCCB 200-25-1	25	200	11
RBCCB 400-25-11	RTCCB 400-25-11	25	400	11
RBCCB 200-35-11	RTCCB 200-35-1	35	200	11
RBCCB 400-35-11	RTCCB 400-35-11	35	400	11
RBCCB 200-50-11	RTCCB 200-50-1	50	200	11
RBCCB 400-50-11	RTCCB 400-50-11	50	400	11
RBCCB 200-70-13	RTCCB 200-70-13	70	200	13
RBCCB 400-70-13	RTCCB 400-70-13	70	400	13
RBCCB 200-95-13	RTCCB 200-95-13	95	200	13
RBCCB 400-95-13	RTCCB 400-95-13	95	400	13



- Grade of Copper used is ETP - Cu, having 99.9% purity.
- Customised Sizes and Length available as per the request.

### Watermain Pipe Bond – Tape Type

Water main Pipe Bonds are used for bonding metallic water main pipes and copper tapes to earthing system. They are used for bonding large diameter pipes and tape to earthing system.

Product Code		Max. Tape Width in mm	Conductor Tape Material
Copper Alloy	Aluminium		
RWP - 01	RWPA - 01	26	Copper / Aluminium
RWP - 03	RWPA - 03	38	Copper / Aluminium



### Rain Water Pipe Bond – Tape Type

Rain Water Pipe Bonds are used for bonding metallic rain water pipes and tapes to earthing system.

#### Solid Tape Type

Product Code		Max. Tape Width in mm	Conductor Tape Material
Copper Alloy	Aluminium		
RRP - 01	RRPA - 01	26	Copper / Aluminium
RRP - 03	RRPA - 03	38	Copper / Aluminium



#### Perforated Tape Type

Product Code		Max. Pipe dia. in mm	Conductor Tape Material
Copper Alloy	Aluminium		
RRP - 101	RRPA - 101	50-500	Copper / Aluminium



- For bonding to ducts and large dia. of pipe works.
- Length as per the customer requirement.
- Perforated Strip can be supplied separately in 50m Roll.

## 2. LIGHTNING PROTECTION

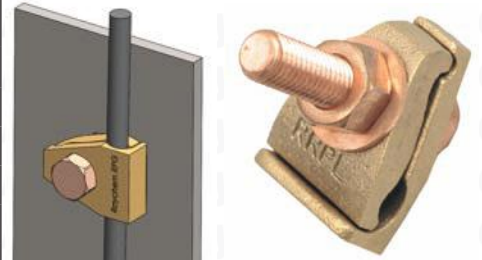
### 2.2.4. Additional Accessories

#### Tower Earth Clamp

Bonding for copper conductors onto steel surfaces.

The double plate design provides robust fixing in areas cladding may be installed or the entire surface may be covered with cement.

Product Code		Conductor Range in Sq. mm	Channel Thickness in mm	Bolt Size
Copper Alloy	Aluminium			
RTB – 01	RTBA – 01	16-70	10	M10
RTB – 02	RTBA – 02	70-120	10	M12
RTB – 03	RTBA – 03	25-50	10	M10
RTB – 04	RTBA – 04	120-185	10	M12
RTB – 05	RTBA – 05	185-240	10	M12



#### B Bond Clamp

Bonding for tape to steel surfaces.

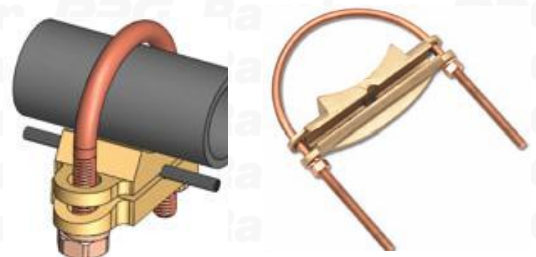
Product Code		Max. Tape Size in mm	Bolt Size	Conductor Tape Material
Copper Alloy	Aluminium			
RBB – 01	RBBA – 01	26	M10	Copper
RBB – 03	RBBA – 03	38	M10	Copper



#### Pipe Clamp (Type 1)

Bonding for conductor to pipe. It provides earth continuity to pipelines.

Product Code		Pipe Dia. in Inch	Conductor in Sq.mm
Copper Alloy	Aluminium		
RPC – 101	RPCA – 101	1/2" - 1"	25 - 95
RPC – 102	RPCA – 102	1.1/4" - 2"	25 - 95
RPC – 103	RPCA – 103	2.1/2" - 3.1/2"	25 - 95
RPC – 104	RPCA – 104	4" - 5"	25 - 95
RPC – 105	RPCA – 105	6"	25 - 95
RPC – 106	RPCA – 106	8"	25 - 95
RPC – 107	RPCA – 107	10"	25 - 95
RPC – 108	RPCA – 108	12"	25 - 95



## Pipe Clamp (Type 2)

Bonding for conductor to pipe. It provides earth continuity to pipelines.

Product Code		Pipe Size in Inch	Conductor Range in Sq. mm
Copper Alloy	Aluminium		
RPC – 01	RPCA – 01	1/2"–1"	Up to 16
RPC – 02	RPCA – 02	1¼" – 2"	Up to 16
RPC – 03	RPCA – 03	2½" – 4"	Up to 16



## Split Connector Clamp

Direct connection of stranded cables lugs to earth rods and most suitable for unthreaded / threaded rods.

### Unthreaded Clamp:

Product Code		Nominal Rod Dia. in mm
Copper Alloy	Aluminium	
RSBU – 01	RSBUA – 01	9.5
RSBU – 02	RSBUA – 02	12.7
RSBU – 03	RSBUA – 03	14.2
RSBU – 04	RSBUA – 04	17.2
RSBU – 05	RSBUA – 05	25.4



### Threaded Clamp:

Product Code		Earth Rod Size in UNC Thread
Copper Alloy	Aluminium	
RSBT – 01	RSBTA – 01	3/8"
RSBT – 02	RSBTA – 02	1/2"
RSBT – 03	RSBTA – 03	5/8"
RSBT – 04	RSBTA – 04	3/4"
RSBT – 05	RSBTA – 05	1"



# 3. EARTHING PROTECTION

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## 3. EARTHING PROTECTION

### 3.1. Earthing And Grounding Solutions

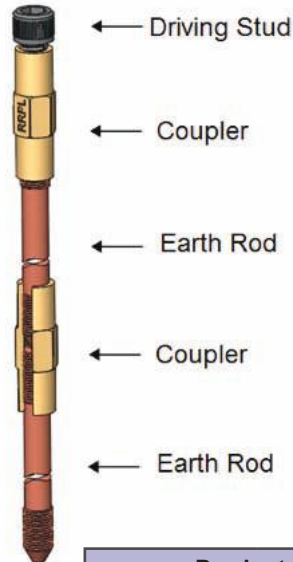
#### 3.1.1. Copper Bonded Earth Rod & Accessories

##### Externally Threaded

Protective earthing of commercial and industrial buildings by dispersing the lightning flashes and fault currents of distribution to the earth.

Product Code (254 microns)	Shank dia.mm	Earth Rod Size in UNC Thread	Rod Length in mm
RET - 01	12.7	9/16"	1200
RET - 02	12.7	9/16"	1500
RET - 03	12.7	9/16"	1800
#RET - 04	12.7	9/16"	2440
#RET - 05	12.7	9/16"	3050
RET - 06	14.2	5/8"	1200
RET - 07	14.2	5/8"	1500
RET - 08	14.2	5/8"	1800
#RET - 09	14.2	5/8"	2440
#RET - 10	14.2	5/8"	3050
RET - 15	17.2	3/4"	1200
RET - 16	17.2	3/4"	1500
RET - 17	17.2	3/4"	1800
#RET - 18	17.2	3/4"	2440
#RET - 19	17.2	3/4"	3050

- For Copper plating thickness <254 microns. (30 microns, 100 microns, 120 microns) etc....
- Add suffix "C" at end of part code.



##### Driving Stud:

The driving stud is used as the impact bearing head when deep driving of earth electrode is required.

Product Code	Earth Rod Size in UNC Thread
RID - 01	5 / 8"
RID - 02	3 / 4"
RID - 03	9/16"

##### Coupler:

Coupler used to combine two / more earth rods.

Product Code		Earth Rod Size in UNC Thread
Brass	Al.Bronze	
RECBR - 01	# RECB - 01	9/16"
RECBR - 02	# RECB - 02	5 / 8"
RECBR - 03	# RECB - 03	3/4"

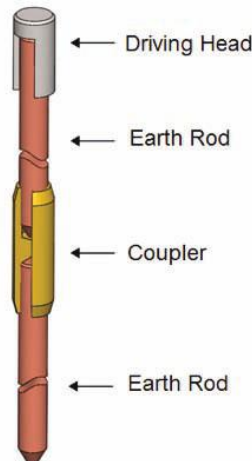


##### UnThreaded

Protective earthing of commercial and industrial buildings by dispersing the lightning flashes and fault currents of distribution to the earth.

Product Code (254 microns)	Earth Rod dia. (mm)	Rod Length in mm
REU - 04	12.7	1200
REU - 05	12.7	1500
REU - 06	12.7	1800
#REU - 07	12.7	2440
#REU - 08	12.7	3050
REU - 09	14.2	1200
REU - 10	14.2	1500
REU - 11	14.2	1800
#REU - 12	14.2	2440
#REU - 13	14.2	3050
REU - 14	17.2	1200
REU - 15	17.2	1500
REU - 16	17.2	1800
#REU - 17	17.2	2440
#REU - 18	17.2	3050

- For Copper plating thickness <254 microns. (30 microns, 100 microns, 120 microns) etc....
- Add suffix "C" at end of part code.



##### Driving Head:

The driving stud is used as the impact bearing head when deep driving of earth electrode is required.

Product Code	Earth Rod Size in UNC Thread
RDH - 01	12.7
RDH - 02	14.2
RDH - 03	17.2

##### Coupler:

Coupler used to combine two / more earth rods.

Product Code		Earth Rod Size in UNC Thread
Brass	Al.Bronze	
REBU - 01	RECU - 01	12.7
REBU - 02	RECU - 02	14.2
REBU - 03	RECU - 03	17.2

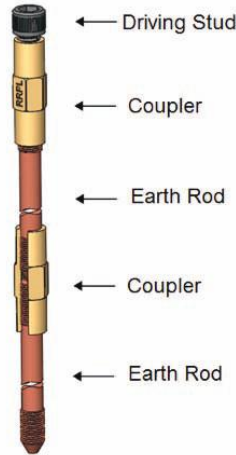


### 3.1.2. Solid Copper Earth Rod & Accessories

#### Externally Threaded

Solid Copper Earth rods used in protective earthing of commercial and industrial buildings by dispersing the lightning flashes and fault currents of distribution to the earth.

Product Code	Earth Rod Size in UNC Thread	Shank Dia. in mm	Length in mm
RES-01	9/16"	12.7	1200
RES-02	9/16"	12.7	1500
RES-03	9/16"	12.7	1800
RES-04	9/16"	12.7	2440
RES-05	9/16"	12.7	3050
RES-06	5/8"	14.2	1200
RES-07	5/8"	14.2	1500
RES-08	5/8"	14.2	1800
RES-09	5/8"	14.2	2440
RES-10	5/8"	14.2	3050
RES-11	5/8"	16	1200
RES-12	5/8"	16	1800
RES-13	5/8"	16	2440
RES-14	5/8"	16	3050
RES-15	3/4"	17.2	1200
RES-16	3/4"	17.2	1500
RES-17	3/4"	17.2	1800
RES-18	3/4"	17.2	2440
RES-19	3/4"	17.2	3050



#### Driving Stud:

The driving stud is used as the impact bearing head when deep driving of earth electrode is required.

Product Code	Earth Rod Dia.	
	UNC Thread	IN mm
RID - 01	5 / 8	14.2
RID - 02	3 / 4	17.2
RID - 03	9 / 16	12.7

#### Coupler:

Coupler used to combine two / more earth rods.

Earth Rod Size in UNC Thread	Product Code	
	Brass	Al. Bronze
9/16	RECBR - 01	# RECB - 01
5 / 8	RECBR - 02	# RECB - 02
3/4	RECBR - 03	# RECB - 03

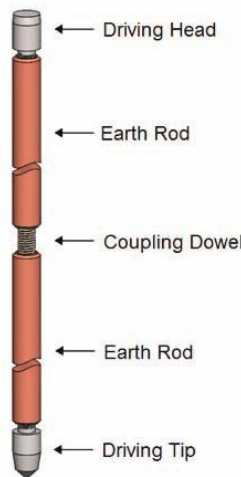
- Representative products tested for **IEC 62561-2:2012**
- Grade of Copper used is ETP - Cu, having 99.9% purity.



#### Internally Threaded

Solid Copper Earth rods used in protective earthing of commercial and industrial buildings by dispersing the lightning flashes and fault currents of distribution to the earth.

Product Code	Thread Dia.	Shank Dia. in mm	Length in mm
RIS-01	M10	15	1200
RIS-07	M10	15	1500
RIS-02	M10	15	1800
RIS-03	M10	15	2440
RIS-08	M10	15	3050
RIS-04	M12	20	1200
RIS-09	M12	20	1500
RIS-05	M12	20	1800
RIS-06	M12	20	2440
RIS-10	M12	20	3050
RIS-11	M10	16	1200
RIS-12	M10	16	1500
RIS-13	M10	16	1800
RIS-14	M10	16	2440
RIS-15	M10	16	3050
RIS-16	M12	19	1200
RIS-17	M12	19	1500
RIS-18	M12	19	1800
RIS-19	M12	19	2440
RIS-20	M12	19	3050



#### Driving Head:

The driving stud is used as the impact bearing head when deep driving of earth electrode is required.

Product Code	Earth Rod Dia. (mm)	Thread Size
RDS - 02	15	M10
RDS - 03	20	M12
RDS - 04	16	M10
RDS - 05	19	M12

#### Coupling Dowell:

Coupler dowell used to combine two / more earth rods.

Product Code	Earth Rod Dia. (mm)
RIC - 01	15
RIC - 02	20
RIC - 03	16
RIC - 04	19

#### Driving Tip:

Driving Tip is used as the bottom of the earth rod.

Product Code	Earth Rod Dia. (mm)
RIT - 01	15
RIT - 02	20
RIT - 03	16
RIT - 04	19

- Grade of Copper used is ETP - Cu, having 99.9% purity.
- The Earth Rods can be supplied with tinplating of 1µm. The tinplating is only for aesthetic reasons.
- The tinplating can be done by hot dipping or electro plating.

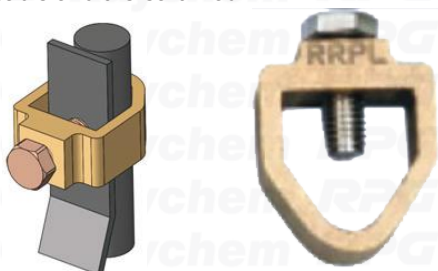


## 3. EARTHING PROTECTION

### 3.2. Clamps & Bonds

#### Rod to Tape Clamp (Type A)

Rod to Cable Clamp is used for providing a secure connection between the down conductor cable and the earth rod.

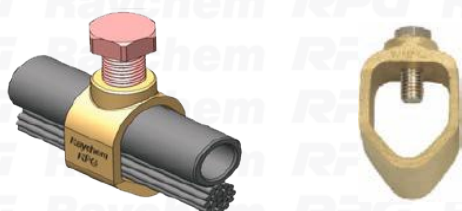


Product Code		Earth Rod Size in UNC Thread	Max. Tape In mm
Copper Alloy	Aluminium		
RCA - 01	RCAA - 01	1/2"	26 x 12
RCA - 02	RCAA - 02	5/8"	26 x 12
RCA - 03	RCAA - 03	3/4"	26 x 10
RCA - 04	RCAA - 04	5/8"	30 x 2
RCA - 05	RCAA - 05	3/4"	30 x 2
RCA - 06	RCAA - 06	5/8"	40 x 12
RCA - 07	RCAA - 07	5/8"	51 x 8
RCA - 08	RCAA - 08	3/4"	51 x 12
RCA - 09	RCAA - 09	1/2"	26 x 20
RCA - 10	RCAA - 10	5/8"	26 x 18
RCA - 11	RCAA - 11	1"	26 x 10



#### Rod to Cable Clamp (Type G)

Rod to Cable Clamp is used for providing a secure connection between the down conductor cable and the earth rod.

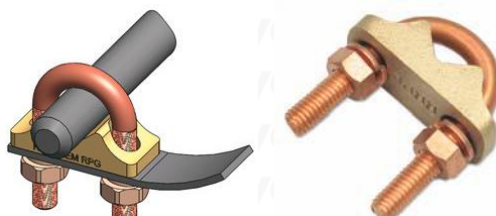


Product Code		Earth Rod Size in UNC Thread	Cross Section in Sq. mm
Copper Alloy	Aluminium		
RCG - 01	RCGA - 01	3/8"	6 - 35
RCG - 02	RCGA - 02	1/2"	16 - 50
RCG - 03	RCGA - 03	5/8"	16 - 70
RCG - 04	RCGA - 04	3/4"	16 - 95
RCG - 05	RCGA - 05	1"	70 - 120
RCG - 06	RCGA - 06	1.1/2"	120 - 150



#### U-Bolt : Single Plate Type For Horizontal Flat Tape (Type "E")

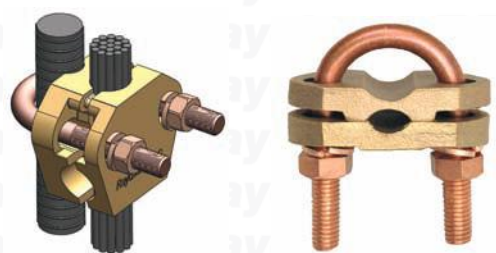
U-bolt Clamps- Single Plate Type is used for providing a secure connection between the horizontal tape and the earth rod.



Product Code		Earth Rod Size in UNC Thread	Hole Centre In mm
Copper Alloy	Aluminium		
RUE - 01	RUEA - 01	5/8"	37
RUE - 02	RUEA - 02	3/4"	37
RUE - 03	RUEA - 03	1"	37
RUE - 04	RUEA - 04	1.1/2"	54
RUE - 05	RUEA - 05	2"	64

#### U-Bolt : Double Plate Type for Vertical Stranded Cable Type

U-bolt Clamps- Double Plate Type for Vertical Stranded Cable Type GUV is used for providing a secure connection between the down conductor vertical stranded cable and the earth rod.



Product Code		Earth Rod Size in UNC Thread	Conductor Range in Sq. mm
Copper Alloy	Aluminium		
RUC - 01	RUCA - 01	5/8"	16 - 150
RUC - 02	RUCA - 02	5/8"	150 - 300
RUC - 03	RUCA - 03	3/4"	16 - 70
RUC - 04	RUCA - 04	3/4"	70 - 300
RUC - 05	RUCA - 05	1"	16 - 70
RUC - 06	RUCA - 06	1"	70 - 300

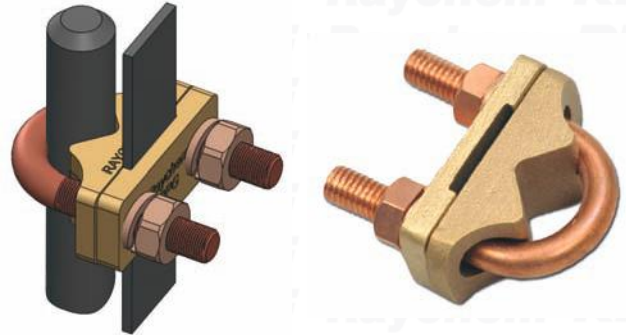




### U-Bolt : Double Plate Type Vertical Flat Tape (Type “E”)

U-bolt Clamps- Double Plate Type is used for providing a secure connection between the vertical tape and the steel reinforcement bar.

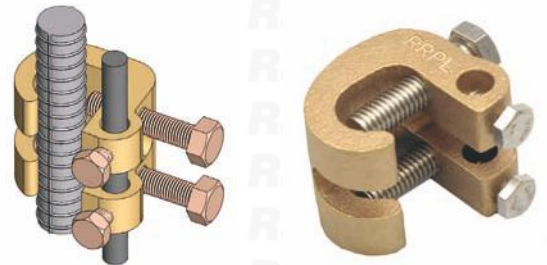
Product Code		Earth Rod Size in UNC Thread	Tape Size in mm
Copper Alloy	Aluminium		
RUD - 01	RUDA - 01	5/8"	25 x 3
RUD - 02	RUDA - 02	3/4"	25 x 3
RUD - 03	RUDA - 03	1"	25 x 3
RUD - 04	RUDA - 04	1.1/2"	25 x 3
RUD - 05	RUDA - 05	2"	25 x 3



### Rebar Clamps

Rebar Clamp is used for providing a secure connection between the down conductor cable and reinforcing bar, steam pipes, handrails etc.

Product Code		Conductor Dia. mm	Rebar Dia. mm
Copper Alloy	Aluminium		
RREC - 01	RRECA - 01	8	8 - 18
RREC - 02	RRECA - 02	8	8 - 38

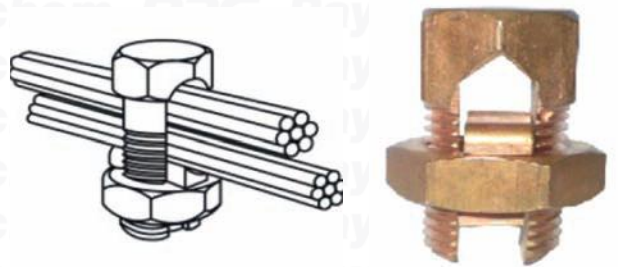


### Split Bolt

“Split Bolt Connector are copper-to-copper connections.

Material : Brass”

Product Code	Main Conductor (A)	Tap Conductor (B)
	In Sq.mm	In Sq.mm
RSBC-01	10	1.5 - 10
RSBC-02	16.00	2.5 - 16
RSBC-03	25.00	2.5 - 25
RSBC-04	35.00	2.5 - 35
RSBC-05	50.00	2.5 - 50
RSBC-06	70.00	2.5 - 70
RSBC-07	95.00	2.5 - 95
RSBC-08	120.00	10 - 120
RSBC-09	150.00	10 - 150
RSBC-10	185	50 - 185
RSBC-12	240	95 - 240



### 3. EARTHING PROTECTION

#### 3.3. Earth Lattice

Earth Lattice used, where touch and step potential could cause a problem.

Product Code		Lattice Size in mm	No. of Strips
ETP Grade Copper	Stainless Steel (SS 316L)		
REL - 01	RELS - 01	500 x 500 x 2	10
REL - 02	RELS - 02	500 x 500 x 3	10
REL - 03	RELS - 03	500 x 500 x 5	10
REL - 04	RELS - 04	600 x 600 x 2	10
REL - 05	RELS - 05	600 x 600 x 3	10
REL - 06	RELS - 06	600 x 600 x 5	10
REL - 07	RELS - 07	900 x 900 x 2	10
REL - 08	RELS - 08	900 x 900 x 3	10
REL - 09	RELS - 09	900 x 900 x 5	10
REL - 10	RELS - 10	1000 x 1000 x 2	12
REL - 11	RELS - 11	1000 x 1000 x 3	12
REL - 12	RELS - 12	1000 x 1000 x 5	12

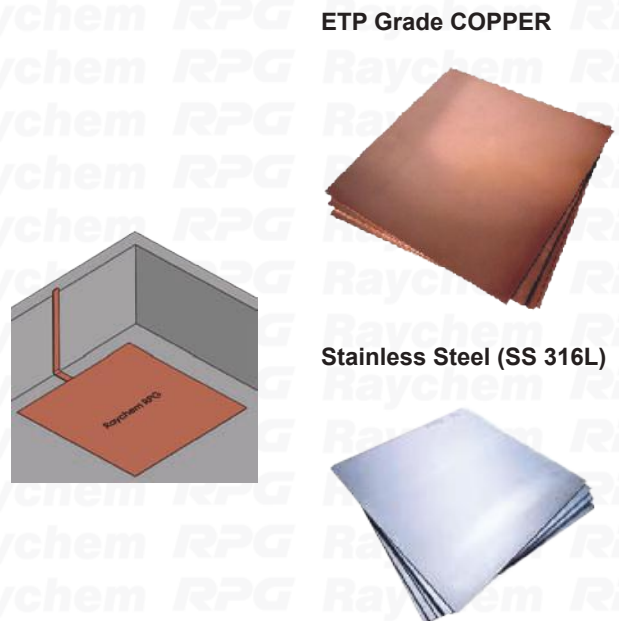
Note : Tape size will be (25x3).  
Customized sizes can be available as per the request.



#### 3.4. Solid Earth Plate

Solid Earth Plate is ideally suitable where soil conditions are very corrosive, such as soil with high salt and moisture content.

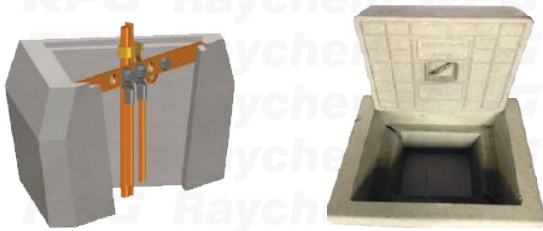
Product Code		Plate Size in mm
ETP Grade Copper	Stainless Steel (SS 316L)	
REP - 01	REPS - 01	500 x 500 x 1.5
REP - 02	REPS - 02	500 x 500 x 3
REP - 03	REPS - 03	600 x 600 x 1.5
REP - 04	REPS - 04	600 x 600 x 3
REP - 05	REPS - 05	900 x 900 x 1.5
REP - 06	REPS - 06	900 x 900 x 3
REP - 07	REPS - 07	1000 x 1000 x 1.5
REP - 08	REPS - 08	1000 x 1000 x 3



### 3.5. Earth Inspection Housing Pits

#### 3.5.1. Concrete Inspection Pit

This facilitates periodic inspection of the connection for corrosion and regular maintenance, to ensure the safety of personnel and equipment from earth fault currents and the high currents injected into the earth by a lightning protection system.



Product Code	Dimensions in mm	Rated Load Kg
RIP - 33	325 (L) x 325 (W) x 190 (D)	3500

#### 3.5.2. Light weight Inspection Pit

Manufactured from high-performance, UV stable and chemically resistant polymer with either polymer or concrete lid to suit the application.



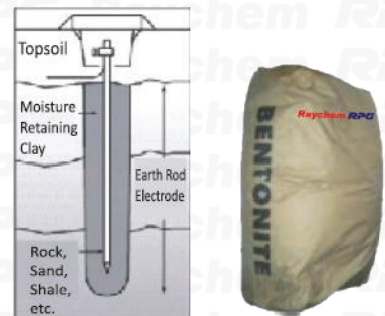
Product Code	Dimension in mm	Rated Load Kg
REP - 33	200 (Dia.) x 1560 (Depth)	5000 kg



- Representative products tested for IEC 62561-2:2012

### 3.6. Earth Enhancing Compound

This Earth enhancing compound used as an earth electrode backfill to reduce soil resistivity. The clay is a sodium activated montmorillonite, which when mixed with water swells to many times its dry volume. It has the ability to hold its moisture content for a considerable period of time and to absorb moisture from the surrounding soil. (e.g. rain fall)



Product Code	Description
RBM - 33	Bentonite Moisture Retaining Clay

### 3.7. Inspection Housing Earth Bar

These earth bars fit into the slots provided in the concrete inspection housing and are used when multiple connections to the earth rod are required.

Product Code	Hole Dia. in mm	No of Holes	Application
RIH - 01	11	5	Refer product RIP-33
RIH - 02	11	7	Refer product RIP-33
RIH - 03	11	5	Refer product REP-33
RIH - 04	11	7	Refer product REP-33



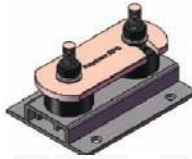
- Cross Section : Earth bar Cross Section (30 x 6) mm

## 3. EARTHING PROTECTION

### 3.8. Additional Accessories

#### 3.8.1. Earth Bar With Disconnecting Link

Disconnecting Link / Test Link

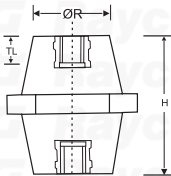


Description	Part Code	Total Length	Total Width	Total Height
Disconnecting Link	RDL-01	125mm	90mm	90mm

#### Standoff Insulators

Standoff Insulators combine high mechanical strength with high arc resistance and dielectric properties at elevated temperatures and humidity.

**Material:** DMC (Dough Moulding Compound).



Product Code	Dimensions				Nominal Voltage (AC / DC)
	Rt Ø mm	Rb Ø mm	TL Ø mm	Height (H) mm	
RH 1045 (M10)	40	32	12	45	1000 / 1200
RH 1050 (M10)	46	35.5	17	50	1200 / 1500

Insert: Brass and Mild Steel. TL: Effective Length

#### Earth Bar



Description	Total Length in mm	Total Width in mm	Total Height in mm	Part No.
6 way	400	90	90	RREB-6
8 way	500	90	90	RREB-8
10 way	650	90	90	RREB-10
12 way	750	90	90	RREB-12
14 way	850	90	90	RREB-14
16 way	950	90	90	RREB-16
18 way	1050	90	90	RREB-18
20 way	1200	90	90	RREB-20
22 way	1300	90	90	RREB-22
24 way	1400	90	90	RREB-24
26 way	1500	90	90	RREB-26
28 way	1650	90	90	RREB-28
30 way	1750	90	90	RREB-30

- Grade of Copper used is ETP - Cu, having 99.9% purity.
- Earth Bar cross section (50 X 6)mm.
- The Earth bar can be supplied with tinplating.
- For Tinned Earth Bar add suffix "T" part code.

#### Fasteners:

Fasteners for earthing components are selected from recommended standard BS 7430:2011.

#### Earth Bar with Single Disconnecting Link



Description	Total Length in mm	Total Width in mm	Total Height in mm	Part No.
6 way	475	90	96	RREB-1-6
8 way	575	90	96	RREB-1-8
10 way	725	90	96	RREB-1-10
12 way	825	90	96	RREB-1-12
14 way	925	90	96	RREB-1-14
16 way	1025	90	96	RREB-1-16
18 way	1125	90	96	RREB-1-18
20 way	1275	90	96	RREB-1-20
22 way	1375	90	96	RREB-1-22
24 way	1475	90	96	RREB-1-24
26 way	1575	90	96	RREB-1-26
28 way	1725	90	96	RREB-1-28
30 way	1825	90	96	RREB-1-30

#### Earth Bar with Twin Disconnecting Link

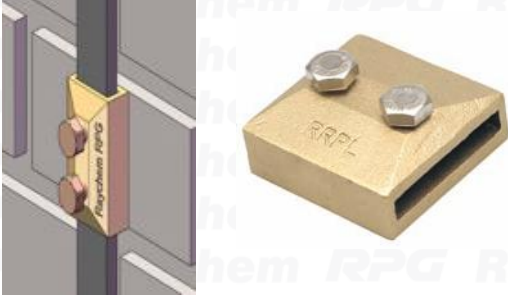


Description	Total Length in mm	Total Width in mm	Total Height in mm	Part No.
6 way	550	90	96	RREB-2-6
8 way	650	90	96	RREB-2-8
10 way	800	90	96	RREB-2-10
12 way	900	90	96	RREB-2-12
14 way	1000	90	96	RREB-2-14
16 way	1100	90	96	RREB-2-16
18 way	1200	90	96	RREB-2-18
20 way	1350	90	96	RREB-2-20
22 way	1450	90	96	RREB-2-22
24 way	1550	90	96	RREB-2-24
26 way	1650	90	96	RREB-2-26
28 way	1800	90	96	RREB-2-28
30 way	1900	90	96	RREB-2-30

### 3.9. Test Link

#### Oblong Test Clamp

Provides an effective low resistance connection and disconnection between overlapping tape / strip conductors. Material: Available High Strength Copper Alloy

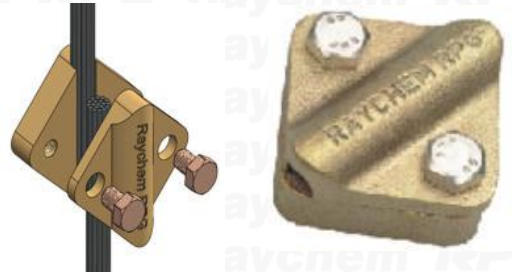


Product Code	Conductor Size in mm	Material
ROC – 01	26 x 8	Copper Alloy
ROC – 02	38 x 6	Copper Alloy
ROC – 03	51 x 10	Copper Alloy



#### Test Clamp

Provides an effective low resistance connection and disconnection between overlapping conductors.



Product Code		Conductor Size in Sq mm
Copper Alloy	Aluminium	
RRCT – 01	RRCTA – 01	35
RRCT – 02	RRCTA – 02	50
RRCT – 03	RRCTA – 03	70
RRCT – 04	RRCTA – 04	95



#### Earth Points

Direct connection to earth conductors or down conductors.

The earth points enable connection to internal rebar arrangements via mechanical clamps as per BS EN 1982:2009 & BS 7430.

Material: Available High Strength Copper Alloy

Product Code	Material	Conductor Size in mm
<b>1 HOLE</b>		
RBP – 01	Copper Alloy	M8
RBP – 02	Copper Alloy	M10
RBP – 03	Copper Alloy	M12
RBP – 04	Copper Alloy	M16
<b>2 HOLE</b>		
RBP – 05	Copper Alloy	M8
RBP – 06	Copper Alloy	M10
<b>4 HOLE</b>		
RBP – 07	Copper Alloy	M8
RBP – 08	Copper Alloy	M10



**Refer Exothermic Welding...**

Page no.: 35

**1 HOLE**



**2 HOLE**



**4 HOLE**



### 3.10. Crimp Connectors

#### C-Shape Connectors

- C- Shape Compression connector for making Run (conductor) and Tap off (conductor) joining two parallel running conductors in above and underground applications.
- Provides maximum conductivity and reduces the possibility of corrosion.
- Suitable for all types of weather conditions / Non-hazardous installation.



Material: High Conductivity Copper

Product Code	RUN mm <sup>2</sup>	TAP mm <sup>2</sup>
RCC – 10-10	2.5 - 6	2.5 - 6
RCC – 8 - 8	10	6 - 10
RCC - 4 - 8		10
RCC – 4 - 6	16 - 25	16
RCC – 4 - 4		16 - 25
RCC – 2 - 4	25-35	10 - 25
RCC – 2 - 2	35	35
RCC – 26 - 2	50 - 70	10 - 35
RCC – 26 - 26		50 - 70
RCC – 28 - 2	95 - 120	16 - 70
RCC – 28 - 26		50 - 70
RCC – 28 - 28		95 - 120



#### 3-Shape Connectors

- 3- Shape Compression connector for making Run (conductor) and Tap off (conductor) joining two parallel running conductors in above and underground applications.
- Provides maximum conductivity and reduces the possibility of corrosion.
- Suitable for all types of weather conditions / Non-hazardous installation.

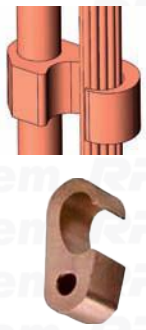


Material: High Conductivity Copper

Product Code	RUN	TAP
	mm <sup>2</sup>	mm <sup>2</sup>
RCC3 2-2	10 - 35	10 - 35
RCC3 26-2	35 - 70	10 - 35
RCC3 26-26	35 - 70	35 - 70
RCC3 29-26	95 - 120	10 - 70
RCC3 29-29	95 - 120	95 - 120
RCC3 34-26	150 - 240	10 - 70
RCC3 34-29	150 - 240	95 - 120
RCC3 34-34	150 - 240	150 - 240
RCC3 2-2	10 - 35	10 - 35
RCC3 26-2	35 - 70	10 - 35
RCC3 26-26	35 - 70	35 - 70
RCC3 29-26	95 - 120	10 - 70

#### 6-Shape Connectors

- 6 - Shape Compression connector making Run (conductor / Rod) and Tap off (conductor) for direct burial in earth or concrete.
- Provides maximum conductivity and reduces the possibility of corrosion.
- Suitable for all types of weather conditions / Non-hazardous installation.



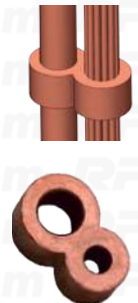
Material: High Conductivity Copper

Product Code	RUN		TAP
	mm <sup>2</sup>	* Ground Ro Dia. in mm	mm <sup>2</sup>
RCC6 2-2	16 – 35	–	16 – 35
RCC6 29-2	50 – 120	12.7 – 15.88	25 – 35
RCC6 29-26			50 – 70
RCC6 29-29			95 – 120
RCC6 34-2	120 – 240	15.88 - 19	25 – 35
RCC6 34-26			50 – 70
RCC6 34-29			95 – 120
RCC6 34-34			185 – 240

\*Note: Suitable for ground Rod of copper, copper clad steel.

#### 8-Shape Connectors

- 8 - Shape Compression connector for making Run (Rod) and Tap off (conductor) joining ground rod to conductor in burial earth or concrete.
- Provides maximum conductivity and reduces the possibility of corrosion.
- Suitable for all types of weather conditions / Non-hazardous installation.



Material: High Conductivity Copper

Product Code	RUN	TAP
	mm <sup>2</sup>	* Ground Rod Dia. in mm
RCC8 26-12	35 – 70	12.7
RCC8 26-58		15.88
RCC8 26-34		19
RCC8 26-100	95 – 120	25.4
RCC8 29-12		12.7
RCC8 29-34		19
RCC8 29-58		15.88
RCC8 29-100	150 – 240	25.4
RCC8 34-34		19
RCC8 34-58		15.88
RCC8 34-100		25.4

\*Note: Suitable for ground Rod of copper, copper clad steel.

# 4. EXOTHERMIC WELDING

## 4. EXOTHERMIC WELDING

### 4.1. Introduction

- The exothermic welding process is a simple, efficient method of permanently bonding of copper to copper or copper to steel.
- Exothermic welded joint carries more Tensile strength than mechanical connections, can be quality controlled simply by visual inspection.
- The Exothermic connection provides per-manent conductivity over the whole of the section due to molecular bonding between the metal surfaces.
- This system is very field friendly since it is light and portable and requires no outside power.

#### **Mould:**

Each Arrestek graphite mould produces a unique type of joint.

#### **Weld Powder:**

Produce high quality electrical connections between different metals (Copper to Copper / Copper to Steel).

#### **Ignition Powder:**

Ignition Powder is used to provide initial flame to the weld powder. It is sprinkled on the top of weld powder.

#### **Steel Retaining Disc:**

The disc acts as timing device to allow the welding powder to heat to proper temperature. Steel Disc is designed to contain the exothermic reaction to the upper crucible of a mold until the reaction is complete and ready to Welding.

#### **Flint Gun / Igniter:**

Used to ignite & initiate in exothermic Reaction.

#### **Hand Gloves:**

Used to provide safety high temperature resistant gloves while working on the exothermic reaction.

#### **Handle Clamp:**

To clamp the two/three part mould together (or) clamping the mould to the surface to which a connection is to be made.

#### **Mould Brush:**

Used for cleaning the scrap on mould after weld joints are completed.



Kit contains all the items required for the safe and efficient operation of exothermic weld.



## 4.2. Installation Guidelines:

The Arrestek exothermic welding process is a simple, self-contained method of forming high quality electrical connections. The compact process requires no external power or heat source making it completely portable. Connections are made inside a semi-permanent graphite mould using the high temperature reaction of powdered copper oxide and aluminium.

### This is how it works:

The Mould (1) features a Crucible (2), a Tap Hole (3) and a Weld Cavity (4).

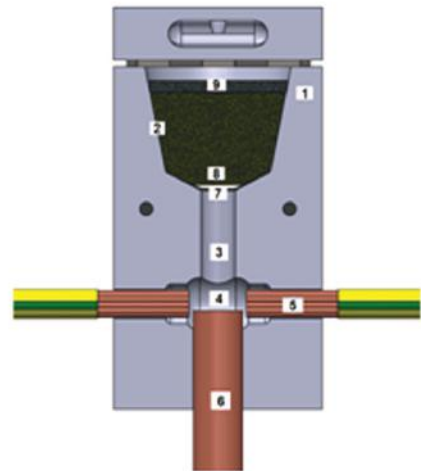
The conductors (5) and (6) to be joined are located in the weld cavity as shown, and the mould is closed. A steel Retaining Disc (7) is located in the bottom of the crucible to retain the Weld Powder (8) and Ignition Powder (9) which are poured in on top.

Ignited with a spark gun, the starting powder sets off an exothermic reaction in the weld powder, reducing it to molten copper alloy. This instantaneously melts the retaining disc, and flows down the tap hole, to the weld cavity, where it partially melts the conductors, before cooling to leave a fusion weld of great mechanical strength and electrical integrity.

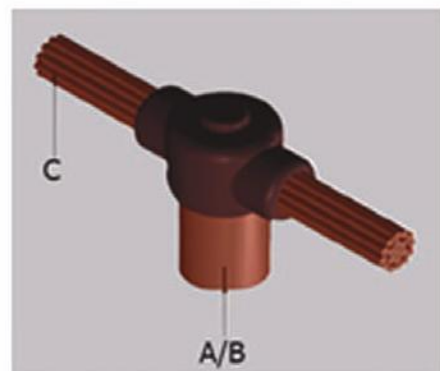
The majority of Arrestek weld connections have at least twice the cross sectional area of the conductors being joined, and an equivalent or greater current carrying capacity.

Because the connection is a fusion of high conductivity, high copper content alloy, it will withstand repeated fault currents, and will not loosen in the way that mechanical connectors can. Corrosion resistance too, is exceptional, due to the alloy's very high copper content (in excess of 90%).

### WELD CONNECTION



### WELD OUTPUT



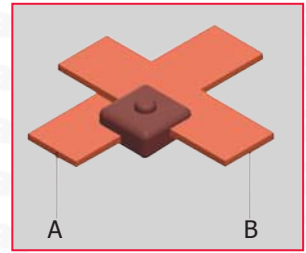
### 4.3. Weld Mould Components

#### 4.3.1. BAR (TAPE) TO BAR (TAPE)\* TYPE - 1 MOULD

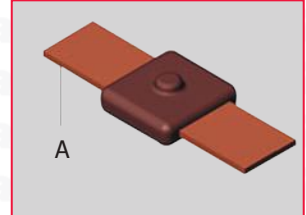
A mm x mm
20 x 2
25 x 3
30 x 4
40 x 3
40 x 4
50 x 3
50 x 5
50 x 6
60 x 6
80 x 5
80 x 6
80 x 8
100 x 5
100 x 10

A / B mm x mm
20 x 2
25 x 3
30 x 4
40 x 3
40 x 4
50 x 3
50 x 5
50 x 6
60 x 6
80 x 5
80 x 6
80 x 8
100 x 5
100 x 10

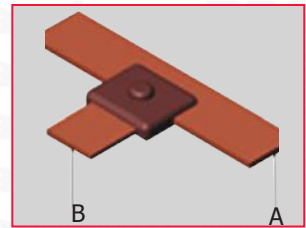
RBB 41 →



RBB 7 →



RBB 14 →

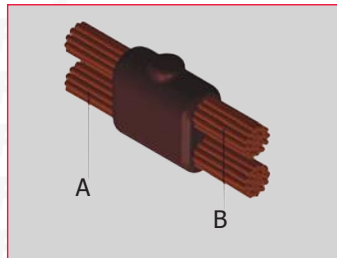


#### 4.3.2. STRANDED CABLE TO STRANDED CABLE\* TYPE - 2 MOULD

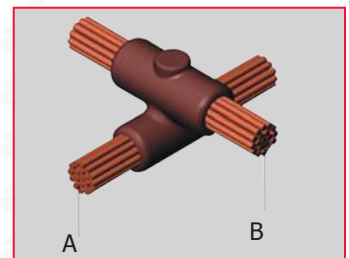
A Sq. mm
10
16
25
35
50
70
95
120
150
185
240
300
400
500

B Sq. mm
10
16
25
35
50
70
95
120
150
185
240
300
400
500

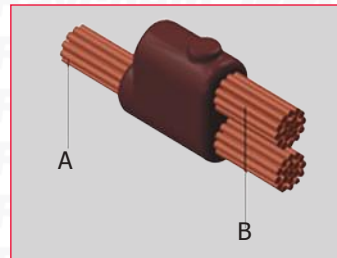
RCC 7



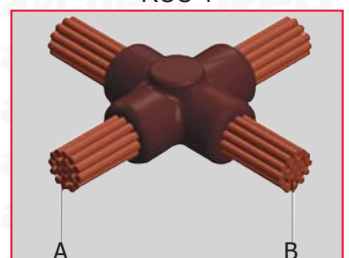
RCC 11



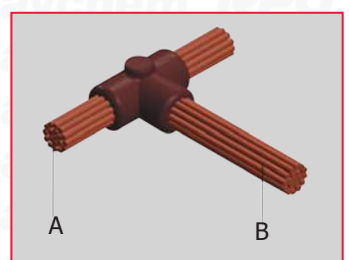
RCC 6



RCC 4



RCC 2



\* Representative sizes shown in here. Other sizes are also available on request.

\* Ordering info. should include 1. Type of Mould, 2. Type of joint 3. Cross section reference (A&B)

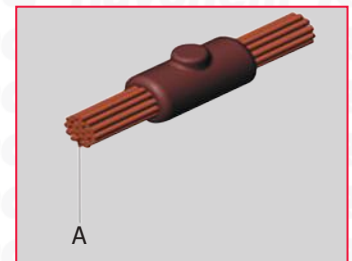
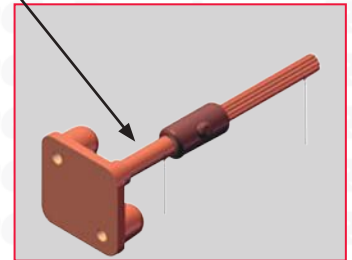
### 4.3.3. STRANDED CABLE TO STRANDED CABLE\* TYPE - 3 MOULD

A Sq. mm
10
16
25
35
50
70
95
120
150
185
240
300
400
500

B Sq. mm
10
16
25
35
50
70
95
120
150
185
240
300
400
500

**Refer Earth Point Details**  
Page no.: 29

Material: BS EN 1982: 2008



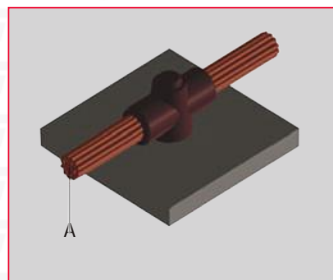
RCC 1 →

### 4.3.4. BAR (TAPE) / STRANDED CABLE TO STEEL SURFACE BONDING\* TYPE - 4 MOULD

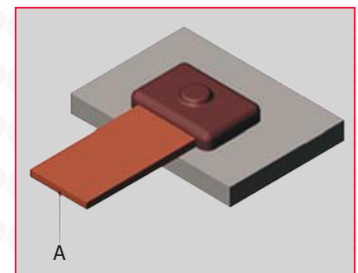
A mm x mm
20 x 2
25 x 3
30 x 4
40 x 3
40 x 4
50 x 3
50 x 5
50 x 6
60 x 6
80 x 5
80 x 6
80 x 8
100 x 5
100 x 10

A Sq. mm
10
16
25
35
50
70
95
120
150
185
240

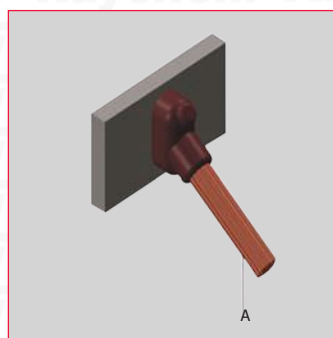
RCS 2



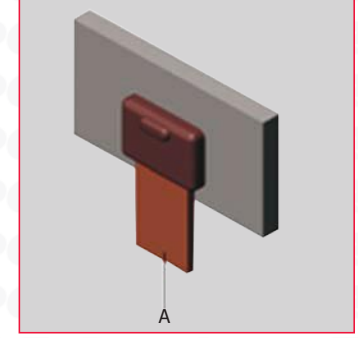
RBS 2



RCS 3



RBS 1



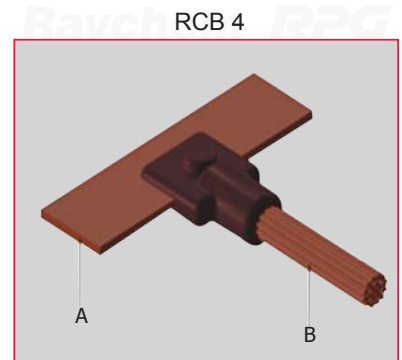
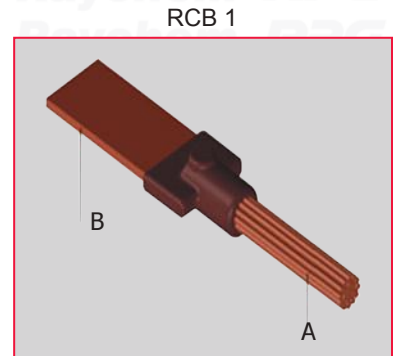
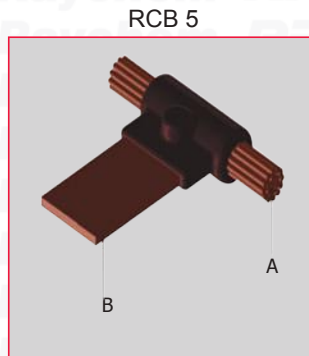
\* Representative sizes shown in here. Other sizes are also available on request.

\* Ordering info. should include 1. Type of Mould 2. Type of joint  
3. Cross section reference (A&B)

#### 4.3.5. BAR (TAPE) TO STRANDED CABLE\* TYPE - 5 MOULD

A mm x mm
20 x 2
25 x 3
30 x 4
40 x 3
40 x 4
50 x 3
50 x 5
50 x 6
60 x 6
80 x 5
80 x 6
80 x 8
100 x 5
100 x 10

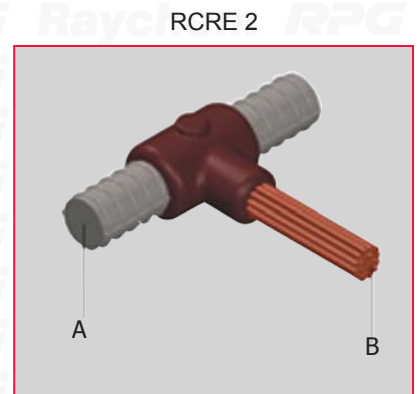
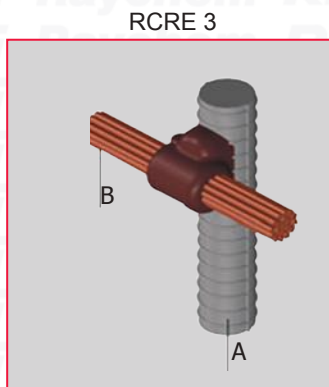
B Sq. mm
10
16
25
35
50
70
95
120
150
185
240



#### 4.3.6. STRANDED CABLE TO REBAR BONDING\* TYPE - 6 MOULD

A mm Φ
10 - 40

B Sq.mm
16
25
35
8 mm Φ
50
10 mmΦ
70
95
120



### 4.3.7 BAR (TAPE) / STRANDED CABLE TO EARTH ELECTROD BONDING\* TYPE - 7 MOULD

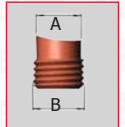
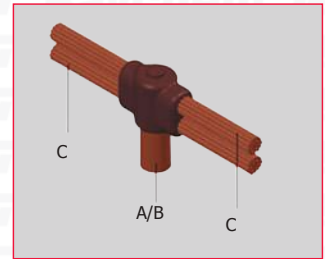
A mm $\Phi$
12.7
14.2
17.2

B Earth Rod Size in UNC Thread
1/2"
5/8"
3/4"

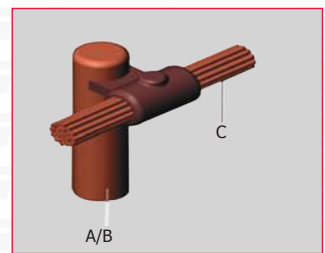
C Sq.mm
16
25
35
50
8 mm $\Phi$
70
95
120
150
185
240
300

C mm x mm
20 x 3
25 x 3
30 x 4
40 x 3
40 x 4
50 x 3
50 x 5
50 x 6
50 x 8

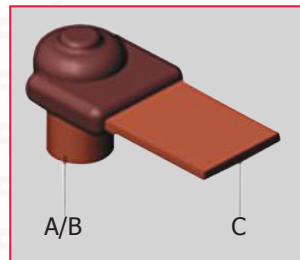
RCR 24



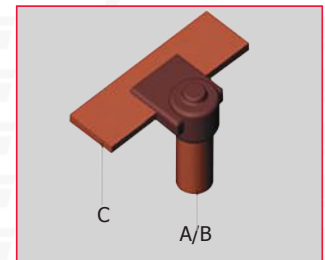
RCR 3



RBR 1



RBR 7



\* Representative sizes shown in here. Other sizes are also available on request.

\* Ordering info. should include 1. Type of Mould 2. Type of joint  
3. Cross section reference (A&B)

## 4.4. Accessories

### 4.4.1. HANDLE CLAMPS

Two-part moulds	HCRRL-4
Two-part moulds	HCRRL-5



### 4.4.2. EXO-THERMIC WELD POWDER

Part No	Raychem RPG Item Description
RWP 015	Exo-thermic Welding Powder 15grams.
RWP 025	Exo-thermic Welding Powder 25grams.
RWP 032	Exo-thermic Welding Powder 32grams.
RWP 045	Exo-thermic Welding Powder 45grams.
RWP 065	Exo-thermic Welding Powder 65grams.
RWP 090	Exo-thermic Welding Powder 90grams.
RWP 115	Exo-thermic Welding Powder 115grams.
RWP 150	Exo-thermic Welding Powder 150grams.
RWP 200	Exo-thermic Welding Powder 200grams.
RWP 250	Exo-thermic Welding Powder 250grams.



**Note:** Ignition powder and steel disc provided as part of weld powder.

### 4.4.3. OTHER MISCELLANEOUS ACCESSORIES

Part No	Raychem RPG Item Description
RFG-01	Flint Gun
RMCB-01	Mould Cleaning Brush
RWCCB-01	Weld Cavity cleaning brush
RFCB-01	File Card Brush
RSRS-01+D13	Slag remover scrapper
RHG-01	Hand Gloves



## 5. ADDITIONAL PRODUCTS AVAILABLE

### 1. **Active System:**

#### **Early Streamer Emission (ESE) Air terminal: With Galvanized Iron (GI) Pipe Support.**

- The Early Streamer Emission (ESE) air terminals are Active Lightning Protection System (LPS).
- The Active air terminal follows the relevant standards as per NFC 17-102, UNE 21186 or similar.
- These do not required any external power supply.

### 2. **Lightning Stroke / Flash Counter.**

It counts the total Lightning Strike and displays in Analogue format.

Note:-

- Manual intervention required.
- Installation in multiple locations for helps in easy maintenance and better results.

### 3. **Surge Protection Devises (SPD's).**

Surge Protection Devices (SPD's) protects the internal distribution boards / equipment against transient induced over voltage / current (Indirect lightning).

- Distribution SPD: Class I, Class I + II (B+C), Class II, Class III.
- Telecomm & Data SPD.

### 4. **Isolating Spark Gap (ISG) / Transient Earth Clamp.**

- Isolating spark gaps are installations above ground or underground which are useful to indirectly earth and connect functionally isolated parts of installations which are under lightning conditions.
- Isolating spark gaps provide galvanic isolation of electrically conducting parts of an installation that must not be connected to each other.



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